

WHAT IS CLAIMED IS:

1. A method for positioning contaminant sensors in an area, the method comprising:
 - identifying at least one potential contaminant release location within the area;
 - modeling a contaminant dispersion pattern using the at least one contaminant release location; and
 - positioning at least one contaminant sensor within the area based on the contaminant dispersion pattern.
2. The method of Claim 1, wherein the at least one contaminant release location comprises a point source.
3. The method of Claim 1, wherein the at least one contaminant release location comprises a line source.
4. The method of Claim 1, further comprising obtaining input data for the modeling from the at least one contaminant release location.
5. The method of Claim 4, wherein the input data comprises at least one hypothetical contaminant concentration.
6. The method of Claim 4, wherein the input data comprises weather conditions.
7. The method of Claim 4, wherein the input data comprises wind speed and/or wind direction.
8. The method of Claim 1, wherein the contaminant dispersion pattern is defined by simulation data.
9. The method of Claim 8, wherein the simulation data comprises contaminant concentration, latitude, longitude, and elevation.
10. The method of Claim 1, further comprising collecting background data that defines normal conditions in the area.
11. The method of Claim 1, wherein the modeling is continuous.
12. The method of Claim 1, wherein the modeling is periodic.

13. The method of Claim 1, wherein the at least one contaminant sensor detects biological, chemical and nuclear contaminants.

14. The method of Claim 1, wherein the at least one contaminant sensor is mobile.

15. The method of Claim 1, wherein the at least one contaminant sensor is stationary.

16. The method of Claim 1, further comprising:
collecting detection data from the at least one sensor; and
identifying the occurrence of unsafe contaminant levels.

17. The method of Claim 16, further comprising responding to the occurrence of unsafe contaminant levels.

18. A method for detecting a contaminant release in an area, the method comprising:

collecting detection data from selectively positioned contaminant sensors;
and
identifying the occurrence of unsafe contaminant levels.

19. The method of Claim 18, wherein the detection data comprises biological, chemical and/or nuclear contaminant concentrations.

20. The method of Claim 18, wherein the detection data comprises weather conditions.

21. The method of Claim 18, wherein the detection data comprises wind speed and/or wind direction.

22. The method of Claim 18, wherein the contaminant sensor comprises optically based sensors, infrared sensors, reagentless optical sensors, bio-chip sensors, fiber optic sensors and/or direct sensors.

23. The method of Claim 18, wherein the contaminant sensor is remotely reprogrammable.

24. The method of Claim 18, wherein the contaminant sensor is remotely positioned.

25. The method of Claim 18, wherein the detection data is continuously collected.

26. The method of Claim 18, wherein the detection data is periodically collected.

27. The method of Claim 18, wherein the contaminant sensors comprise locations established for sampling air, groundwater, surface water, sediment and soil.

28. The method of Claim 18, further comprising collecting background data that defines normal conditions in the area.

29. The method of Claim 18, further comprising real-time modeling of contaminant dispersion patterns.

30. The method of Claim 18, wherein unsafe contaminant levels are detected by comparing the detection data to a modeled dispersion pattern.

31. The method of Claim 18, wherein the unsafe contaminant levels are detected by comparing the detection data to background data that defines normal conditions in the area.

32. The method of Claim 18, further comprising signaling a response system when unsafe contaminant levels are identified.

33. The method of Claim 18, further comprising collecting and analyzing syndromic data from humans, plants and/or animals.

34. The method of Claim 18, wherein the sensors are selectively placed by:

identifying at least one potential contaminant release location within the area;

modeling a contaminant dispersion pattern using the at least one contaminant release location; and

positioning the contaminant sensors within the area based on the contaminant dispersion pattern.

35. A method for responding to a contaminant release in an area, the method comprising:

detecting a contaminant release using selectively placed sensors; and responding to the contaminant release upon its detection.

36. The method of Claim 35, wherein a contaminant release is detected by collecting detection data from selectively positioned contaminant sensors and identifying the occurrence of unsafe contaminant levels.

37. The method of Claim 36, wherein the detection data comprises biological, chemical and/or nuclear contaminant concentrations.

38. The method of Claim 36, wherein the detection data comprises weather conditions.

39. The method of Claim 36, wherein the detection data comprises wind speed and/or wind direction.

40. The method of Claim 35; further comprising implementing protective measures immediately following the detection of a contaminant release.

41. The method of Claim 40, wherein the protective measures comprise medical response procedures for emergency rooms and hospitals.

42. The method of Claim 40, wherein the protective measures comprise warning alarms, instructions for personal protection and/or news updates.

43. The method of Claim 40, wherein the protective measures comprise sealing of at least one building and/or room.

44. The method of Claim 40, wherein the protective measures comprise operation of at least one positive pressure system.

45. The method of Claim 40, wherein the protective measures comprise introduction of clean air.

46. The method of Claim 40, wherein the protective measures comprise closing of travel routes.

47. The method of Claim 35, wherein a detection system and a response system communicate via an information technology infrastructure.

48. The method of Claim 35, wherein the sensors are selectively placed by:

identifying at least one potential contaminant release location within the area;

modeling a contaminant dispersion pattern using the at least one contaminant release location; and

positioning the contaminant sensors within the area based on the contaminant dispersion pattern.

49. An array of selectively positioned sensors within an area, wherein positions of the sensors are determined by:

identifying at least one potential contaminant release location within the area;

modeling a contaminant dispersion pattern using the at least one contaminant release location; and

positioning at least one contaminant sensor within the area based on the contaminant dispersion pattern.

50. The array of Claim 49, wherein the sensors communicate using an information technology infrastructure.